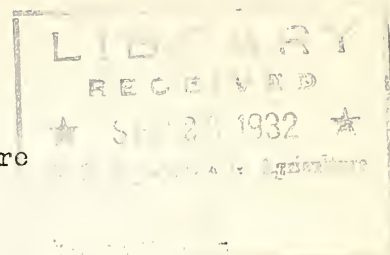


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FOOD HABITS OF FISH-EATING BIRDS

Fish-eating birds, like most other birds, feed on what is common and easy to get. Their choice of food is so largely governed by availability that in most waters they will get only a small proportion of game or commercial fishes, as it is in small proportions that these fishes occur. Not only are the more valuable fishes rare as compared with the noncommercial species, but they also usually inhabit deeper water and are swifter. Hence they are harder to catch than many of the so-called coarse fishes. In some trout streams there may be a preponderance of trout over other fishes, but even in these streams the birds often find and capture water insects, crustaceans, frogs, snakes, and other creatures more easily than they do the elusive trout.

Wondering what becomes of the immense numbers of trout fry that are planted in streams, anglers naturally attribute their disappearance to the enemies that are most obvious, and they are particularly likely to blame the larger fish-eating birds, such as the herons. Studies of trout streams by the Biological Board of Canada, however, show that the greatest losses in trout fry are caused by enemy and competitor fishes. Few people realize what serious destroyers of spawn there are among the fishes themselves—such species, for instance, as sticklebacks, sculpins, suckers, and minnows.

After hatching, the little fishes are decimated by cannibalistic attacks, of which none are worse than those of the trout and other game fishes themselves. Besides the fish enemies of fishes the streams teem with insect and other enemies, such as the larvae of the predaceous diving beetles, or "water tigers," nymphs of dragon flies, giant water bugs, and crawfishes. All such enemies in turn are preyed upon by birds, and it is probable, except at fish hatcheries, that in most cases fish-eating birds more than make up for the harm they do in eating valuable fishes by their destruction of natural enemies of the whole fish tribe.

Illustrating the food habits of fish-eating birds by those of the great blue heron, which is one of the largest and most conspicuous of the group, it may be reported that in 150 stomachs examined, commercial or game fishes occurred only a few times, as follows: Eel, once; grunt, once; pickerel, twice; trout, 9 times; sunfishes, 10; yellow perch, 13; and catfish, 17 times. A mere consideration of these numbers would give an impression adverse to the bird, were it not for the fact that sunfishes are not of great value either for food or sport, and catfishes are notorious spawn eaters. That the great blue heron undoubtedly eats scores of the enemy and competitor fishes for every trout that it consumes is shown by the fact that among such fishes the following occurred in the stomachs mentioned: Suckers in 29, minnows in 23, sticklebacks in 14, darters and carp in 7 each, killifish in 5, and sculpins, gars, and madtoms in smaller numbers.

The diet of great blue herons is by no means restricted to fishes, and in it are several arthropod enemies of fishes, as dragon-fly larvae in 37 stomachs, crawfishes in 33, giant waterbugs in 9, and predacious diving beetles in 7. Some of the other miscellaneous items found in the food were snakes, frogs, salamanders, including the mud puppy, and leeches. The salamanders, leeches, and water snakes also are classed as enemies of fishes.

The great blue heron takes a considerable number of small mammals also, especially meadow mice. Meadow mice were found in 8, other mice in 4, and shrews in 5 of the 150 stomachs reported upon. Many observers in Western States have commented on the destruction of harmful rodents by great blue herons, and in 1889 a law was passed in California protecting the bird on account of its feeding on pocket gophers and ground squirrels.

The great blue heron is known, however, to be destructive about fish hatcheries, and the Department of Agriculture has issued an order permitting the control of this and other fish-eating birds at such places. On the other hand, in localities away from hatcheries, it is certain that the bird ordinarily consumes a much larger number of fishes not utilized by man than it does of those that are. Among these, as has been noted, are numerous spawn-eating fishes, which if allowed to live, probably would do more harm to game and commercial fishes than does the heron. If one considers thus the other fish enemies destroyed by the heron, there is little doubt that under natural conditions the bird does more good than harm.

This account of the great blue heron is illustrative; the story of fish-eating birds in general is the same. It is not necessary to discuss in detail the food habits of group after group of these birds, as all of them take what is most common and easy to get. This results as a rule in the birds preying largely not upon game fishes but upon the enemy and competitor species, which constitute the greatest obstacle to restocking operations.